Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A reactor core capable of being mounted in a lower portion of a reactor pressure vessel comprising a core support plate mounted on the lower portion in the reactor pressure vessel and an upper grid disposed on and above the core support plate, said reactor core comprising:

a plurality of fuel assemblies configured to be supported by the core support plate and the upper grid so as to be arranged in a square grid form at a certain pitch; and

a plurality of control rods having a cruciform cross-section comprising four blades each having a width (B), each of said control rods being adapted for insertion into four adjacent spaces between four fuel assemblies facing each other, wherein a ratio (B/S) of the width (B) of the control rod blades to a surface area (S) of a square having sides each being equal to the pitch between the fuel assemblies is set in a range of 0.06 to 0.08 cm^{-1}.

2. (Previously Presented) A reactor core as claimed in claim 1, wherein said fuel assemblies comprise fuel rods and said fuel rods contain uranium, plutonium, or oxides or nitrides of the two elements as nuclear fuel material.

3. (Presently Amended) A reactor core as claimed in claim 2, wherein ~~said~~ fuel rods disposed around said fuel assemblies contain thorium as the nuclear fuel material.

4. – 6. (Canceled)

7. (Withdrawn) A reactor core as claimed in claim 1, wherein a fuel assembly has a plurality of fuel rods charged with a fissionable material thereinto, and a mean enrichment of said fissionable material is the same for all loaded fuel assemblies.

8. – 10. (Canceled)

11. (Withdrawn) A method for operating a nuclear reactor, comprising the steps of:

mounting a reactor core on a lower portion in a reactor pressure vessel;

arranging a plurality of fuel assemblies in said reactor core in a square grid at a certain pitch;

inserting a plurality of cross-sectional cruciform control rods into four adjacent spaces formed by four fuel assemblies facing each other;

setting a numeric value of 0.06 cm^{-1} or greater which is selected for a ratio (B/S) of a width (B) of each blade on said control rods to a surface area (S) of a square having sides each being equal to the pitch between said fuel assemblies; and

operating at an excess reactivity of no less than 5% Δk and no more than 10% Δk.

12. (Withdrawn) A method for operating a nuclear reactor, as claimed in claim 11, wherein said operating is effected such that the maximum value of a core-averaged void coefficient observed during power operation of said nuclear reactor is generated at a time other than the end of an operating cycle, the minimum value of said core-averaged void coefficient is generated at the end of the operating cycle, and the difference between the minimum and maximum values of the core-averaged void coefficient is kept at 20% or greater.

13. (Withdrawn) A method for operating a nuclear reactor, as claimed in claim 11, wherein said reactor core is operated with said control rods inserted into said reactor core by 30% or greater of axial length of said control rods.

14. (Withdrawn) A method for operating a nuclear reactor, as claimed in claim 12, wherein said reactor core is operated with said control rods inserted into said reactor core by 30% or greater of axial length of said control rods.

15. – 16. (Canceled)